Attorney Docket No. 22111.00

IN THE APPLICATION

OF

SEAN REGISTER

FOR A

LIGHTWEIGHT ROOFING SLATE

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LIGHTWEIGHT ROOFING SLATE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/461,940, filed April 11, 2003.

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to roof tiles, and more particularly to lightweight roof slates adapted to withstand lifting from the pressure of high forced winds.

2. DESCRIPTION OF RELATED ART

A large variety of roofing tiles exist in the marketplace. The existing roofing tiles vary in style, shape, material and mounting method. Roofing tiles are typically made from clay, cement, fiberglass or asphalt. Roofing tiles can be made as small square tiles, large panels or even in sheets that are rolled onto the roof. Roofing tiles are typically layered onto a roof in an overlapping manner and then secured to the roof using an adhesive. In some situations roofs are equipped with a plurality of support

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beams or battens. Tiles have commonly been mounted to the battens with fasteners and mortar for a more secure connection. A common problem with roofing tiles is that they are generally not waterproof and may be damaged by water or even fail to prevent leaks into the roof. Another problem with existing roofing tiles is that they cannot withstand the pressure from high forced winds. In areas of the world where hurricanes are common it is often difficult to maintain roof tiles without having them lifted from the roof during a storm. The following patent documents provide disclosures of common roofing materials and assemblies.

United States Patent Application Publication No. 2001/0045070 to Hunt discloses autoclaved aerated concrete panels. The panels are suggested for use in many applications including roof panels. The autoclaved aerated concrete panels are monolithic. The panels include notches that make the entire structure interlocking.

United States Patent No. 4,091,135 issued to Tajima et al. discloses a laminated roofing membrane. The invention is a self-adhesive roofing membrane that is suitable for the formation of the roofing or waterproof layer on roofs. The membrane comprises a base sheet, at least one bitumen layer coated on both faces of the base sheet, at least one layer of compound bitumen including bitumen, rubber and resin laminated on the surface of the bitumen coated layer on the base sheet and at least one release sheet laid over the entire surface of the compound bitumen layer. The

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roofing membrane is easily applied to a substrate. The membrane provides increased waterproofing to the roofing materials.

United States Patent No. 4,107,885 issued to Lindal discloses a prefabricated roof section. The roof section comprises a quadrilateral substrate and a roof covering its top. The covering comprises tapered roof shingles. The shingles are positioned so that the top of one shingle is overlapped by the bottom on an adjacent shingle.

United States Patent No. 5,060,445 issued to Jong discloses a roof construction formed of overlapping rows of tiles retained in place by elongated horizontally extending members. The roofing tiles all have flanges that are secured to the retaining members. The tiles and the retaining members are secured in position by a series of parallel baseboards that form a part of the substructure of the roof assembly. The tiles are strengthened at their side edges by reinforcing plates that are received beneath the tiles. The reinforcing plates also assist in preventing flow of water between the edges of adjacent tiles.

United States Patent No. 5,791,112 issued to Plum discloses a roof slate arrangement. The arrangement includes a plurality of spaced apart parallel battens. A plurality of rows of roof slates is supported on the battens. Adjacent rows of slates are offset in relation to one another. A support strip is disposed between the adjacent slates and extends from one batten to the next.

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Attachment elements secure the slates to the battens. The suppc strip protects a waterproof strip, which is positioned under t slates, but leading water away from the waterproof strip.

United States Patent No. 6,148,578 issued to Nowacek et a discloses a slate and interlayment roof. Each course of slates underlain with an interlayment material layer so that t interlayment material acts as a base to the through joints. T interlayment material provides waterproofing for the slates. T slates are secured to the roof using fasteners.

United Kingdom Patent Application GB 2147021 discloses roofing slate. The slate has holes near the center of ea longitudinal edge for center securing. In addition to these hol there is a slot that is centrally positioned from the upper ed of the slate. This leaves a narrow bridging band that connects the main body of the slate. The band allows the slates to secured to a batten on the roof.

United Kingdom Patent Application GB 2251635 discloses a ro tiling system. The roof tiles are arranged in stagger horizontal rows. The rows of tiles are staggered to ensure th the roof is waterproof. The tiles are connected using a fasteni clip. The clip is slidable along the tile to allow for tl position of the connecting tiles to be adjusted. The clip preferably made from a plastic material.

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United Kingdom Patent Application GB 2267297 discloses wind resistant roofing elements. The roofing elements are provided with a plurality of cooperating means for interlocking the elements with at least two adjacent roofing elements. The cooperating means is preferably an overlapping means for interconnecting the elements. The elements are provided with a series of interlocking recesses and projections that secure the elements to the roof. The elements are wind resistant because due to the interlocking system, individual roofing elements cannot be released from the roof under wind pressure.

International Application WO 94/18413 and United States Patent No. 5,540,029 issued to Elias disclose a wind-resistant roofing tile. The roof tile provides improved resistance to lifting and damage due to wind. The roof tile includes a wind uplift preventing step that shields the forward end surface of an adjoining tile to prevent the adjoining tile from being lifted in high winds. The roof tiles also have tapered top surfaces that offer low wind resistance profiles. The tiles are interlocking and are fastened together at the rear by a plurality of fasteners. The fasteners secure each tile to the roof below the tile and an adjacent tile above it. The tiles are made from a variety of materials including masonry material, plastic composites, polymer composites and metals. If masonry material is used, a masonry adhesive such as cement or mortar is also used.

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None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed.

SUMMARY OF THE INVENTION

The present invention is a lightweight roofing slate that is resistant to the pressure of high forced winds. The roofing slates are preferably made from autoclaved aerated concrete that is lightweight, fireproof, termite proof and can withstand hurricane force winds when properly mounted to a roof. The slates are generally rectangular and each weigh less than five pounds. The roofing slates may be colored by using tinted sealers to match the building that they are being attached to. The roof slates comprise a bottom surface, a top surface, a mounting end and a distal end.

The roofing slates are applied to the roof in an overlapping formation. The mounting end of each roofing slate is directly secured to the roof of a building by a windlock anchor. The roofing slates are positioned along the roof so that the distal end of a first roofing slate overlaps the mounting end of an adjacent roofing slate. An adhesive material, foam or mortar, is applied to the bottom surface of each roofing slate so that the overlapping roofing slate is secured to the top surface of the adjacent roofing slate and each roofing slate is further secured

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to the roof. The roofing slates are positioned on the roof so that the distal end of the roofing slate nearest the end of the roof extends past the roof to allow rain water to be diverted beyond the walls of the building. The combination of the adhesive and the windlock anchor provide a connection that is resistant to the pressure of high forced winds.

A nontoxic, water based sealer is applied to the top surface of the roofing slates after they are secured to the roof. The overlapping formation and the sealer make the roofing slate assembly water proof as well as resistant to wind pressure. The sealer causes the rainwater to slide down the roof along the roofing slates and away from the house. The rain water may be collected and used for personal use.

Accordingly, it is a principal object of the invention to provide roofing slates that may be securely mounted to the roof of a building so that they are highly resistant to the pressure from high forced winds.

It is another object of the invention to provide roofing slates that are easily attached to any roof surface.

It is a further object of the invention to provide roofing slates made from autoclaved aerated cement that are lightweight and waterproof, fireproof and termite proof.

Still another object of the invention is to provide roofing slates that may be offered in a wide range of sizes and colors.

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It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an environmental, perspective view of a house with an assembly of lightweight roofing slates according to the present invention.

Fig. 2 is a side perspective view of a roof covered with lightweight roofing slates.

Fig. 3 is a side cross sectional view of a lightweight roofing slate.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is a lightweight roofing slate that is highly resistant to the pressure caused by high forced wind. When

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the lightweight roofing slates are properly secured to the roof of a building they can prevent lifting of the roof tiles due to wind pressure. The lightweight roofing slates would be particularly advantageous to people who are often subject to hurricane force winds. Fig. 1 depicts a house with a roof covered with a lightweight roofing slate assembly 10 according to the present invention. The lightweight roofing slate assembly 10 may be easily attached to any building structure.

Fig. 2 depicts a side perspective view of a roof 60 covered with the roofing slate assembly 10. The roofing slate assembly 10 comprises a plurality of lightweight roofing slates 20. Each roofing slate 20 comprises a mounting end 22 and a distal end 24. The roofing slates 20 cover the entire top surface of the roof 60. The roofing slates 20 are positioned in an overlapping relationship to one another with the first of said roofing slates 20 placed at the peak of the roof 60 and the last roofing slate 90 hanging over the bottom edge 52 of the roof 60.

Each of the roofing slates 20 are directly secured to the roof 60 using a windlock anchor 40. The windlock anchor 40 prevents the roofing slates 20 from lifting due to pressure from high forced winds. The windlock anchor 40 mounts the mounting end 22 of the roofing slate 20 to a weatherproof underlayment 50 on the roof 60 or to a batten system. The batten system is spaced up to nine inches apart horizontally. The weatherproof underlayment

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50 is preferably a 30 to 90 granular felt that is applied with a cold mop process or as a peel and stick membrane. The distal end 24 of the roofing slate 20 is not secured to the roof 60 by a windlock anchor 40. The distal end 24 of the roofing slate 20 overlaps the mounting end 32 of an adjacent roofing slate 30. Each successive roofing slate 20 is mounted in this overlapping manner until the edge 52 of the roof 60 is reached. As shown in Fig. 2 the distal end 94 of the last roofing slate 90 extends beyond the edge of the roof 60.

Fig. 3 depicts a side cross sectional view of a roofing slate 20. The roofing slate 20 further comprises a top surface 26 and a bottom surface 28. The windlock anchor 40 extends from the top surface 26 of the roofing slate 20 to the bottom surface 28 of the roofing slate 20 and into the roof 50 (shown in Fig. 2). The windlock anchor 40 depicted in Fig. 3 is preferably a screw fastener with a plastic washer. The windlock anchor 40 is positioned 1 inch from the edge of the mounting end 22 of the roofing slate 20.

An adhesive layer 80 is applied to the bottom surface 28 of the roofing slate 20. The adhesive layer 80 enhances the attachment of the roofing slates 20 the roof 60. The adhesive layer 80 also secures the distal end 24 of the roofing slate 20 to the mounting end 32 of the adjacent roofing slate 30 when

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overlapped. The adhesive layer 80 is preferably a mortar, thinset or foam adhesive, but is not limited to these adhesives.

Once the roof slates 20 are directly secured to the roof 60 they are coated with a sealer 70. The sealer 70 is a nontoxic water base sealer. The sealer 70 is preferably a combination of a cement wash and a nontoxic sealer. The sealer 70 may also be an elastomeric coating or any other coating that has the properties to seal the roof slates 20. The sealer 70 provides enhanced waterproofing for the roof slates 20. The overlapping arrangement of the roofing slates 20, combined with the sealer 70, prevents rain water from coming into contact with the roof 50. Instead of penetrating the roof 50, rain water simply slides down the roof along the roof slates 20. Because the last roof slate 90 extends beyond the walls of the building, the rain water is dumped away from the building where it may optionally be collected for personal use.

The lightweight roofing slates 20 are preferably made from autoclaved aerated concrete. Autoclaved aerated concrete does not readily transfer heat making it an excellent insulating material. Autoclaved aerated concrete is extremely durable and is fire and termite proof. The autoclaved aerated concrete may be easily made in varying sizes and in varying colors. The roofing slates 20 may be made in a variety of sizes up to 18 inches by 12 inches by 1

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inch. The roofing slates are extremely lightweight. A roofing slate with the previous dimensions weighs only 4.8 pounds.

The roof slates 20 are installed by applying a first row of roof slates 20 that may be either regular concrete or autoclaved aerated concrete. The first row of roof slates may be applied with pressure treated spacer blocks to obtain the initial slope. Each of the roof slates 20 is fastened to the roof 60. Before inserting the windlock anchors 40, the adhesive 80 is placed on the bottom surface 28 of the roof slates 20. It is not necessary to coat the entire bottom surface 28. The adhesive 80 may optionally be applied on 2-4 inch strips that are positioned 2 inches from the mounting end 22 and the distal end 24 of the roof slates 20. The roof slates 20 are then placed in a staggered overlapping pattern until the entire roof 60 is covered.

It is to be understood that the present invention is not limited to the sole embodiment described above, but encompasses any and all embodiments within the scope of the following claims.

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